

**NATURAL RESOURCES CONSERVATION SERVICE  
INTERIM CONSERVATION PRACTICE STANDARD****STREAM CROSSING**

(No.)

CODE ~~503A~~ 728**Definition**

A trail or travelway constructed across a stream to allow livestock or equipment to cross without disturbing the bottom or causing erosion on the banks. Does not include culvert crossings.

**Purpose**

To improve water quality by controlling erosion where livestock or equipment must cross a ditch or stream by providing a single stable crossing that permits exclusion of livestock from other areas of the stream channel

**Conditions where practice applies**

This practice applies where stable crossings are needed for livestock and/or equipment. Does not apply to Access Road (560) or to other areas for public access.

**Criteria**

**Location.** Stream crossings shall be located in areas where the streambed is stable. Avoid sites where channel grade or alignment changes abruptly, overfalls exist, or tributaries enter the stream. Wetland areas shall be avoided.

Crossings shall be installed perpendicular to the direction of flow of the stream.

**Capacity.** Bankfull capacity shall not exceed 1000 cfs.

**Velocity.** Velocities shall not be greater than 5 fps at bankfull capacity or at the elevation of the 10-year 24-hour storm, whichever is less. Velocity may be calculated using "Mannings" equation.

**Width.** The minimum width of the stream crossing shall be 10 feet.

**Grades.** The placement of the geotextile and the finished surface grade are critical factors in the design of properly functioning stream crossings. Stream crossings shall be placed on stable channel grades. Surfacing stone shall not be higher than the natural channel stable grade.

**Entrance slopes.** Entrance slopes to the crossing shall blend with existing site conditions where possible, but shall not be steeper than 5:1. The entrance slope shall be underlain with geotextile and covered with stone or gravel to bank elevation or the elevation of the 10-year 24-hour storm, whichever is less. Minimum rock thickness shall be 8 inches.

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Surface runoff shall be diverted around the entrance slope to prevent erosion of the surfacing materials. Runoff shall be diverted either upstream or downstream to a point from which it cannot flow back toward the entrance or exit ramp.

**Filter or bedding.** Filters or bedding shall be used to prevent piping. A filter consisting of a 3 inch layer of sand and nonwoven geotextile shall be installed under the entire crossing including access slopes and in the toe trenches.

**Geocell.** A geosynthetic cellular confinement system (Geocell) shall be placed at design grade.

**Rock.** Stone shall be used to fill the geocell. The stone shall be dense and hard enough to withstand exposure to air, water, freezing and thawing.

**Cutoff Walls.** Cutoff walls are needed at the beginning and end of stream crossings to protect against undercutting. Cutoff walls are also needed at the upstream and downstream ends and along the perimeter of the entrance slopes.

**Fencing.** For stream crossings used for livestock access, livestock shall be excluded from adjoining areas of the stream by permanent fence or otherwise excluded.

### **Vegetation**

All areas to be vegetated shall be established to grass as soon as practicable after construction. All disturbed areas shall be vegetated according to practice standard Critical Area Planting (342).

### **Plans and Specifications**

Plans and specifications for stream crossings shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

### **Operation and Maintenance**

The stream crossing should be inspected at least annually by the landowner or operator and stone replaced as needed. The stream crossing and associated fence should be inspected after each major storm event and repairs made as needed.

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE GENERAL SPECIFICATIONS****STREAM CROSSING**

(NO.)

CODE ~~583A~~ 728**GENERAL SPECIFICATIONS****Foundation Preparation**

The foundation area shall be cleared of trees, stumps, roots or other objectionable material. The cross section shall be excavated to the neat lines and grades shown on the plans. No abrupt deviations from design grade or horizontal alignment shall be permitted.

Construction shall be done in such a manner that erosion and air and water pollution are minimized and held within reasonable and legal limits. The completed job shall be workmanlike and present a good appearance. All disturbed areas shall be vegetated or otherwise provided with a cover to protect the areas against soil erosion.

**Geocell**

Geocell shall be a minimum of 6 inches deep.

**Rock**

Individual rock fragments shall be dense, sound and free from cracks, seams and other defects conducive to accelerated weathering. The rock fragments shall be angular to subrounded in shape. The least

dimension of an individual rock fragment shall be not less than one-third the greatest dimension of the fragment.

Rock used for access slopes and filling of the geocell shall meet the following gradation:

Size of Rock	% Smaller by Weight
3 inches	100
2 1/2 inches	90-100
2 inches	35-70
1 1/2 inches	0-15
3/4 inches	0-5

**Nonwoven geotextile**

Nonwoven geotextile shall be a minimum 8 ounces per square yard and shall meet the following requirements:

Property	Test Method	Requirement
Tensile Strength	ASTM D 4632	180 lb. min.
Bursting Strength	ASTM D 3786	320 lb. min.
Elongation at Failure	ASTM D 4632	50% min.
Puncture	ASTM D 4833	80 lb. min.
Ultraviolet Light (percent residual tensile strength)	ASTM D 4355	70% min.
Apparent Opening Size	ASTM D 4751	# 40 max.
Permittivity	ASTM D 4491	0.70/sec. min.

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Nonwoven geotextile shall be placed with the length perpendicular to the direction of flow. All laps shall be a minimum of 18 inches and installed with the upper perpendicular length overlapping the lower adjoining segment. Geotextile shall be pinned as recommended by the manufacturer.

### **Sand Bedding**

Sand bedding shall consist of a maximum 3 inch layer of concrete sand meeting ASTM C-33.

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